Virginia Space Grant Consortium (VSGC)

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PROGRAM DESCRIPTION

The National Space Grant College and Fellowship Program consists of 52 state-based, university-led Space Grant Consortia in each of the 50 states plus the District of Columbia and the Commonwealth of Puerto Rico. Annually, each consortium receives funds to develop and implement student fellowships and scholarships programs; interdisciplinary space-related research infrastructure, education, and public service programs; and cooperative initiatives with industry, research laboratories, and state, local, and other governments. Space Grant operates at the intersection of NASA's interest as implemented by alignment with the Mission Directorates and the state's interests. Although it is primarily a higher education program, Space Grant programs encompass the entire length of the education pipeline, including elementary/secondary and informal education. The Virginia Space Grant Consortium is a Designated Consortium funded at a level of $575,000 for fiscal year 2012.

PROGRAM GOALS

VSGC Goal 1 - Conduct quality scholarship and fellowship programs including a bridge program for freshman and sophomore students, research awards for undergraduate and graduate students, community college STEM scholarships and teacher education STEM scholarships.

1.A: Each academic year, award students in all five categories with scholarships and fellowships. Students will be competitively selected by review panels consisting of representatives from member institutions. Metric: Review panel for each program reports on the process and total number of awards; **1.B:** Award at least the minimum amount required by NASA in scholarship and fellowships to at least 60 students each academic year. Metric: Total amount awarded to total number of students in the five scholarship/fellowship categories; **1.C:** Each academic year, provide a percentage of awards to underrepresented minority and female students that is consistent with the diversity target as established by NASA (currently 24.6%). Metric: Total awards to minority students divided by total awards to all students; **1.D:** At least 90% of students receiving research awards will attend and present at the annual VSGC Student Research Conference. Metric: Total number of research awardees presenting at conference divided by total number of research awardees; **1.E:** Longitudinally track 100% of all students receiving significant awards to identify their next step in academia or the workforce. Metric: Total number of students longitudinally tracked to next step divided by total awardees; **1.F:** At least 60% of students receiving significant awards will be employed by NASA, an aerospace contractor, higher education or other educational

institutions. Metric: Total number of students employed in these categories divided by total number of awards; **1.G:** At least 45% of undergraduate students receiving significant support from VSGC will move on to advanced education in NASA-related disciplines in their next step. Metric: Total number of students in advanced education in these categories divided by total number of awards.

VSGC Goal 2 - Offer quality higher education programs including internship programs in partnership with our member institutions and partners.
2.A: Each academic year, provide paid internships for at least 4 students at NASA Centers or with industry partners. Metric: Number of students placed in internships;
2.B: Conduct at least one annual higher education project in partnership with Virginia's community colleges. Metric: Number of collaborative projects with community colleges or the System office; **2.C:** Each year, conduct at least two higher education projects in partnership with VSGC member institutions. Metric: Number of collaborative projects with members.

VSGC Goal 3 - Promote diversity in all programs and activities by encouraging participation by underrepresented minority and female students and faculty.
3.A: Each year, conduct at least one outreach event in partnership with Hampton University (HBCU) to promote programs and opportunities to students and faculty. Metric: One Hampton University outreach event; **3.B:** Each year, conduct at least one outreach event in partnership with a non-member minority institution to promote programs and opportunities to students and faculty. Metric: One non-member MSI outreach program; **3.C:** Each academic year, provide a percentage of student awards to underrepresented minority and female students that meets or exceeds the diversity target as established by NASA (currently 24.6% for underrepresented minorities and 40% females). Metric: Total awards to minorities divided by total number of awards; **3.D:** Provide at least one STEM program each year for special needs faculty or students. Metric: Number of programs provided; **3.E:** Undertake at least one collaborative program with a non-member minority serving institution each year. Metric: Number of programs provided.

VSGC Goal 4 – Undertake programs that foster research capabilities at our member institutions and serve as a catalyst for linking university researchers to NASA and other opportunities.
4.A: Conduct a New Investigator award program each year targeting tenure track faculty who are within the first five years of their academic career. At least five awards will be given annually and the research will have NASA relevance. Metric: Number of awards provided; **4.B:** Disseminate at least 20 research opportunity announcements to statewide networks each year. Metric: Number of announcements disseminated; **4.C**: Facilitate at least five meetings with university researchers and NASA personnel, as appropriate, resulting in at least two collaborative proposals being submitted. Metric: Number of proposals submitted;. **4.D:** Support at least two experiential student research, mission and design programs each year. Metric: Number of programs supported.

Goal 5 – Provide quality precollege educational opportunities including professional development for precollege and pre-service educators and student-focused programs for students throughout the precollege pipeline.

5.A: VSGC will provide professional development in STEM and using NASA resources to at least 40 teachers each year. Metric: Total number of teachers participating in professional development activities; **5.B**: VSGC will reach over 100 students by conducting selected student-focused programs and activities promoting participation in STEM and related careers. Metric: Total number of precollege students participating in student-focused programs; **5.C**: At least 75% of precollege educators participating in more than two days of professional development will use NASA resources in their classroom following the workshop. Metric: Total number of educators indicating they will use NASA resources in the classroom on a post-event survey divided by total respondents to survey; **5.D:** At least 60% of precollege educators receiving NASA resources or participating in VSGC-led short duration activities will use NASA resources in their classroom. Metric: Total number of educators indicating they will use NASA resources in the classroom on a post-event survey divided by total respondents to survey; **5.E:** At least 50% of all precollege students participating in VSGC-sponsored programs will express an interest in STEM careers. Metric: Total number of students indicating they have an interest in a STEM career on a post-event survey divided by total respondents to survey.

Goal 6 - Conduct Informal Science Education programs in partnership with informal education members and partners.

6.A: Sponsor at least one program each year with the Virginia Air and Space Center or the Science Museum of Virginia. VSGC will consider other appropriate informal science education opportunities as funding and partnerships permit with the goal of providing at least one other activity per year if funding and resources permit.

Goal 7 - Serve as an effective steward of Consortium resources and a strong partner for STEM programs.

7.A: Effectively leverage NASA Space Grant resources. Metric: NASA Space Grant funding will be leveraged by at least 3 dollars to 1 NASA Space Grant Dollar as evidenced in Consortium year-end Matching/Contributed Funding Report; **7.B:** Network with other Space Grants and Space Grant organizations. Metric: Evidence of networking and program partnerships; **7.C:** Network with NASA Headquarters and NASA Centers for program implementation. Metric: Evidence of networking and program partnerships; **7.D:** Build and sustain effective strategic partnerships, including relationships with state and federal legislators and officials. Metric: Evidence of state and federal support for VSGC programs and documented attendance by these individuals at select activities and events; **7.E:** Number of program partners working with VSGC each year. Metric: At least 30 non-member partners per year.

PROGRAM/PROJECT BENEFIT TO OUTCOME (1,2, & 3)

NASA Education Outcome 1: With funding from the Commonwealth of Virginia through VSGC-member institution Virginia Tech, the VSGC created the Commonwealth STEM Industry Internship Program (CSIIP). CSIIP offers a centralized, online

application system that enables STEM undergraduates at accredited Virginia colleges and universities to search and apply for paid, STEM-related summer internships with Virginia companies. VSGC partnered with Virginia's regional technology councils that serve as the program's conduit to member companies. For summer 2013, 92 companies have registered with CSIIP. More than 500 students were pre-screened for internship placement, and 46 interns have been placed to date at 26 companies. CSIIP also produced a series of six webcasts for interns posted online for general viewing. These webcasts provide information on how STEM studies can translate into careers throughout Virginia's aerospace and industrial sectors; as well as how to interview, negotiate, and research prospective employers. CSIIP was announced by Governor Robert F. McDonnell and received significant support from the cabinet including the Secretaries of Education, Technology, and Commerce and Trade.

Simone Hyater-Adams, a three-year awardee of the VSGC Undergraduate STEM Bridge scholarship during 2010-2013, is a rising senior physics major and math minor at Hampton University. She was a Langley Aerospace Research Student Scholars (LARSS) intern for summer 2012, and is a NASA Undergraduate Student Research Program (USRP) intern for summer 2013 at NASA Langley Research Center. Simone was also awarded a VSGC Undergraduate Research Scholarship for the 2013-14 academic year. She hopes to continue conducting research in the areas of physics education and optical research. Simone plans to continue on to earn a Ph.D. degree and hopes to run her own research group that will contribute to NASA's innovations for the future.

NASA Education Outcome 2: VSGC received funding from the Commonwealth of Virginia through the University of Virginia, a member institution, for Building Leaders for Advancing Science and Technology (BLAST). BLAST is an on-campus, summer STEM experience for rising 8th and 9th grade high school students. Offered free, BLAST brings STEM alive through a series of innovative experiences led by university faculty and staff at the University of Virginia (summer 2013). Demonstrations and activities showcase exciting science and engineering topics with the goal of increasing student curiosity and engagement in STEM. BLAST is a partnership between the VSGC, University of Virginia, and the Commonwealth of Virginia. A total of 160 students are participating (80-8th graders and 80-9th graders).

PROGRAM ACCOMPLISHMENTS

VSGC actively works with its members and many external partners to accomplish Consortium goals. NASA's funding investment is heavily leveraged by external funding from federal and state agencies and other nongovernmental sources. The external funding enhanced the VSGC's ability to staff and run a wide range of programs in concert with NASA goals.

NASA Education Outcome 1

Scholarship/Fellowship/Internships (VSGC Goals 1-3)

For the 2013-14 academic year, the VSGC awarded $316,100 in scholarships and fellowships from NASA Space Grant funds, Consortium funds, and State matching funds ($170,000) to 82 students attending Virginia universities. VSGC decided to discontinue

offering the Teacher Education STEM scholarship due to low applicant levels in previous years. Funding for these scholarships was redirected into the other four scholarship/fellowship programs. VSGC met all goals and objectives and exceeded the diversity target by awarding 37% to minorities and 40% to female students. All students will be tracked to their next step and reported in the future.

- $195,000 went to 39 students for Graduate Research Fellowships; matching funds of $722,522 to support graduate research awards were also provided by member institutions.
- $86,100 went to 13 students for Undergraduate Research Scholarships.
- $25,000 went to 25 sophomore and junior students majoring in STEM through the Undergraduate STEM Bridge scholarship program.
- $10,000 went to five community college students majoring in STEM.

During FY12, VSGC held the annual Student Research Conference at which research awardees presented their research. In April 2013, Old Dominion University hosted the conference and sponsored the luncheon in honor of the awardees. VSGC met the student attendance goal as 98% of research awardees attended and presented their research. The event was also attended by faculty and NASA personnel, industry representatives, and state legislators.

VSGC also provided $61,253 in Space Grant, Consortium, and matching funding to 10 students to support internships and travel for 2013.

- Three student internships at NASA Langley in the Langley Aerospace Research Student Scholars Program (LARSS).
- Student internship with the Virginia Science Technology Engineering and Applied Mathematics (STEAM) Academy.
- Student internship during spring semester at NASA Wallops Flight Facility through OSSI:SOLAR.
- Student internship at the NASA Academy at Marshall.
- Student internship at the Aeronautics Academy at NASA Glenn.
- Student internship at NASA Academy at Ames.
- Student internship at NASA Johnson Space Center.
- Student internship at NASA Goddard Space Flight Center.

<u>Higher Education (VSGC Goal 2)</u>
All objectives within VSGC's Higher Education Goal 2 were met. VSGC established a new industry internship program, the Commonwealth STEM Industry Internship Program. VSGC collaborated with the Virgnia Community College System, a Consortium member, and three four-year colleges on an externally funded project to support geospatial pathways. VSGC partnered with two non-member HBCUs for proposals to seek external funding. No funds were requested for STEM programs for students or faculty with special needs. VSGC was prepared to support teachers to attend a special needs workshop being planned by the South Carolina Space Grant but the event was postponed. VSGC will continue to offer this support in the future and seek

partnerships in this area. VSGC collaborated with several member institutions for higher education projects as described below.

- VSGC is a partner in Old Dominion University's (ODU) Engineering Early Advantage Program for Women (EEAPW). EEAPW is a four-week paid summer headstart program for female freshman engineering majors at ODU. The event includes academic and career enhancing activities in a unique engineering setting. Many activities are based at the Virginia Modeling, Analysis and Simulation Center (VMASC). VSGC provides the student stipend for the 15 female participants.
- VSGC sponsored Virginia Tech for the Lower Atmosphere/Ionosphere Coupling Experiment (LAICE) project. LAICE is a 6U cubesat mission that was selected by NASA for launch through the ELaNa program, and by the NSF through its 2012 cubesat competition. ELaNa provides a spot on the launch manifest but no funding. This project will perform a satellite mission that cannot be done economically by larger satellites, while providing hands-on experience for student engineers and scientists. Virginia Tech is teamed with the University of Illinois, The Aerospace Corporation, and Colorado Research Associates on the LAICE mission, with Virginia Tech as the lead institution. Two undergraduate students, one graduate student and one faculty member participated in the project.
- VSGC Director coordinates and leads a statewide small satellite working group to encourage and facilitate partnerships to grow student-led projects. Members of the group include representatives from higher education and NASA partners.
- VSGC supported a collaboration between Virginia Tech and NASA's Johnson Space Center (JSC) in the spring of 2013. The collaboration involved student projects in the area of intelligent textiles and wearable technologies for space flight. Staff at JSC specified three project topics (inflatable textile structures, space boot controller for a jet pack, and adaptable crew clothing) for the students. Eight undergraduate students and two faculty developed concepts and prototypes for these topics. The students and faculty traveled to JSC for a one-day symposium in April, where the students presented their concepts and prototypes, attended presentations about related work at JSC, and toured the facilities.
- VSGC, in partnership with Colorado Space Grant Consortium, offered a RockOn! workshop in June 2013. RockOn! is a workshop for faculty and students in which participant teams learn to build a small sounding rocket payload from kits and launch it on a sounding rocket at NASA Wallops Flight Facility. The hardware in the kit can be used on future custom RockSat payloads and possibly CubeSat flights. Full impact data will be reported by the Colorado Space Grant Consortium.
- VSGC supported the cash prizes for the three winners of the higher education poster contest at the Virginia GIS Conference and also Virgina Tech's GIS Conference.
- VSGC partnered with faculty and administrators from Virginia State University (VSU), a non-member HBCU, and Old Dominion University to submit a proposal to NSF-STEM Talent and Expansion (STEP) program to target female freshman engineering majors with retention strategies and academic support. Proposal is pending.

- VSGC partnered with five member institutions and two non-member HBCU institutions, VSU and Norfolk State University, to submit a proposal to the Space Grant Innovative Pilot in STEM Education CAN for a project providing middle-school pre-service teachers with scholarships, support, and professional development to be come effective STEM teachers. Proposal is pending.

  Research Infrastructure (VSGC Goal 4)
  VSGC met all objectives in Goal 4 including disseminating more than 20 research opportunities, sponsoring experiential student research programs, and facilitating meetings to discuss proposals. VSGC also sponsored three research opportunities offered through the New Investigator Program (NIP).

  - NIP is designed to strengthen Virginia's research infrastructure by providing startup funding to Virginia Space Grant university personnel who are conducting research that is directly aligned with NASA's mission. This opportunity is made available to those who have yet to become established researchers. Three faculty members from VSGC member institutions received an award of $10,000 each for their research project. Awardees must be tenure track faculty and US Citizens who are within the first five years of their academic careers. Proposals were competitively reviewed by a panel comprised of VSGC Advisory Council members representing the various universities, and NASA personnel. FY12 NIP Awardees: Dr. Kunio Sayanagi, Hampton University, Atmospheric and Planetary Sciences: Cassini Imaging Science Investigation of Saturn's Cloud Dynamics; Dr. William McNamara, College of William and Mary, Department of Chemistry: Immobilization of Bio-Inspired Transition Metal Complexes on Ti0 for the Photocatalytic Generation of Hydrogen; Dr. Chris Williams, Virginia Tech, Mechanical Engineering: Small Satellite Fabrication via Additive Manufacturing.
  - The development of the Small Satellite Technologies (SST) laboratory at Old Dominion University was formally started in December 2011 with support from VSGC using both NASA Space Grant and Consortium matching funding. The goal of SST is to promote student interest in satellite technologies at ODU and beyond. The activity of the SST Lab is directed by two faculty, one from the Electrical and Computer Engineering (ECE) Department, and one from the Mechanical and Aerospace (MAE) Engineering Department. A joint ECE-MAE senior design project was created to test the controlled deployment of a Mylar balloon prototype from the aluminum enclosure and inflation in a vacuum chamber. Another joint ECE-MAE project was initiated to design and develop a prototype of a cubesat de-orbit device that will reduce the orbital lifetime of cubesats in low Earth orbit to less than 25 years. Other activities include preparing the designed drag device for a sounding rocket flight, testing the power systems of a nanosatellite, and student-developed LabView code that allows remote monitoring of sensor data.

NASA Education Outcome 2

Higher Education (VSGC Goal 7)

The Director and staff annually brief Virginia Congressional and state legislators. VSGC works with state officials and legislators to assist with STEM and aerospace policy advocacy. The Director serves on the Governor's Aerospace Advisory Council. The Council consists of legislative, industry, and other members. VSGC serves as a key advisor for STEM education on the council. The Director is also a member of, and co-facilitates with the NASA Langley Research Center Director, the Informal Aerospace Working Group of about a dozen aerospace sector leaders in Virginia including the NASA Wallops Flight Facility Director, the Directors of the Mid-Atlantic Regional Spaceport, National Institute of Aerospace, and the Virginia Department of Aviation as well as industry representation. The goal of the group is collaboration for STEM education and workforce development as well as aerospace advocacy for the Commonwealth including extensive planning for the Commonwealth's annual Aerospace Day and supporting events. VSGC is responsible for coordination of aerospace sector messages for the meetings with state policy makers for this event.

The VSGC Director and staff participate in activities such as Aerospace Day at the General Assembly, the Virginia Science Education Leadership Association, Virginia Society for Technology in Education, and the Virginia Association of Science Teachers. State cabinet officials and state legislators have participated in VSGC programs such as the Student Research Conference, the Commonwealth STEM Industry Internship Program, and the Virginia Aerospace Science and Technology Scholars (VASTS) program. Nearly all state legislators have been active in recognizing VASTS Scholars from their districts.

Precollege Programs (VSGC Goal 5)

VSGC's suite of precollege programs includes projects targeting both students and teachers and aligns with NASA's areas of emphasis. Evaluation instruments and surveys were conducted of all participating teachers. VSGC met all Goal 5 objectives reaching more than 1,100 students and providing professional development to more than 750 teachers to assist them in becoming better STEM educators and effectively using NASA resources in the classroom.

- The Virginia Aerospace Science and Technology Scholars (VASTS) program is an interactive online STEM learning experience, highlighted by a seven-day residential summer academy at NASA Langley Research Center. High school juniors selected to participate in the program are immersed in NASA-related research through interaction with scientists, engineers and technologists. Top performing students in the online course are selected to attend one of three residential sumemr academies hosted by Langley. Students receive two credits from Thomas Nelson Community College for completing the online course and two more credits for completing the summer academy. A total of 540 students participated in the online course and 180 attended the summer academies. The program is a partnership between the VSGC and NASA Langley with assistance from the Virginia Department of Education and

industry. VASTS is modeled after the NASA-award winning Texas Aerospace Scholars program developed by NASA Johnson Space Center.

- VSGC coordinated four engineering technology-themed STEM Exploratory Saturday programs for 214 middle school grade students and 205 parents through the Governor's Academy for Innovation, Technology, and Engineering (GAITE) in partnership with Thomas Nelson Community College (TNCC), NASA Langley Research Center, ECPI, and Canon Virginia. All four hosted a Saturday event while TNCC help provide a college campus experience for the students. Huntington Ingalls-Newport News Shipbuilding was also a partner and provided instruction for several student sessions.
- VSGC supported the cash prizes for the three winners of the precollege poster contest at the Virginia GIS Conference.
- Building on the excitement around scientific exploration missions launched from NASA Wallops Flight Facility and the Mid Atlantic Regional Spaceport, and with funding from the Commonwealth of Virginia through VSGC-member Old Dominion University, the VSGC established the Virginia Space Coast Scholars (VSCS) program. VSCS is designed to inspire high school sophomores that possess latent science and technical skills to participate in a dynamic online STEM learning experience. VSCS is an informal online learning experience highlighted by a seven-day residential summer academy at NASA Wallops Flight Facility for qualifying students. With a focus on scientific exploration, students are introduced to STEM concepts that are integral to earth and space-based missions launched or conducted from Virginia's Space Coast on the Eastern Shore. Students work in teams and are mentored by NASA scientists and engineers to design, construct, and fly a payload to obtain scientific data for analysis. A total of 141 students participated in the five-module online course while 40 students will attend the Summer Academy (August 2013).
- VSGC supported the annual professional development conference hosted by the Virgnia Association of Science Teachers (VAST) in fall 2012. This conference is attended by over 500 science teachers and adminstrators from Virginia. VSGC also exhibited and presented Space Grant programs during a breakout session.
- VSGC was a partner with the Hampton Roads Technology Council and other organizations to offer a one day teacher expo titled, STEM Connect – STEM in the Classroom. This professional development opportunity, hosted by Old Dominion University, provided precollege teachers with presentations on the best practices for teaching STEM. Exhibitors also provided hands-on expereinces for teachers and discussions on best practices. VSGC sponsored the event and was also an exhbitor. An estimated 200 teachers will attend the STEM expo (August 2013).
- VSGC provided $1,000 to support the Wise County Student Space Station Experiment in rural southwest Virginia. This project supported students and teachers in preparing a payload to launch into space and conduct experiments on the ISS.
- VSGC partnered with the Center for Excellence in Education (CEE) to offer a professional development experience for teachers titled Bite of Science, Dinner with a Scientist. This one-day workshop hosted by Tidewater Community College (TCC) was attended by 25 teachers. TCC Physics Professor Dr. David Wright engaged the crowd with fun and interactive physcis demonstrations. Other presenters included

representatives from WR Systems, a local engineering organization, and Huntington Ingalls-Newport News Shipbuilding.

- VSGC partenred with PBS Affiliate WGBH's Design Squad Nation, the Virginia Department of Education, and NASA Langley Research Center to create a free one day workshop aimed at educators in grades 3-8. This workshop will introduce participants to resources that will help students deepen their understanding of the design process, create awareness of the vibrancy of space exploration in a post-shuttle era, and increase their motivation to pursue engineering. Participants will learn how to use Design Squad Nation and Mission: Solar System's challenges, and free online resources. Educators will participate in hands-on activities, view the video resources, and learn tips for incorporating the resources into classroom and afterschool usage. Each participant will receive a set of free Design Squad Nation activity guides. Design Squad Nation is an NSF-funded, multimedia program whose goal is to inspire the next generation of engineers (August 2013).
- VSGC is a partner and sponsor for the Cooperating Hampton Roads Organizations for Minorities in Engineering (CHROME). Hosted and led by Norfolk State University, CHROME works through middle and high school-based clubs led by teachers (sponsors) to provide activities and events related to engineering. VSGC is represented on the CHROME board and regularly helps identify speakers and content. CHROME sponsors are invited to VSGC teacher professinoal development opportunities.

NASA Education Outcome 3

Informal Education Programs (VSGC Goal 6)

VSGC exceeded its informal education program goal by sponsoring three projects in partnership with the Virginia Air and Space Center.

- VSGC sponsored the 2013 Yuri's Night celebration hosted by the Virginia Air and Space Center, a Consortium member. A total of 619 attended the event. Yuri's Night is a global celebration of humanity's past, present, and future in space with parties and events held around the world every April in commemoration of April 12, 1961, the day of cosmonaut Yuri Gagarin's first manned spaceflight. Yuri's Night at the VASC combines space-themed celebration with education and outreach.
- VSGC provided funding to support the Virginia Air and Space Center to plan and offer a teacher professional development workshop in fall 2013 through the Center's "Train, Teach & Involve" program. The "Mars Colony" workshop will target about 50 5th grade teachers in the Hampton Roads region of Virginia. Teachers will compare and contrast conditions and human needs on Mars and Earth. Teachers will also learn about the Apollo program and future vehicles needed to reach and explore Mars.
- VSGC supported motivational speaker Arel Moodie to serve as a keynote speaker during one of Virginia Air and Space Center's Opportunity Program events. The presentation was free and open to the public and targeted toward Title 1 Hampton City School children and invited guests. A total of 55 attending the presentation titled, "Anything is Possible." Arel is one of America's top young speakers and has been recognized by President Obama for his work as a young leader in America.

PROGRAM CONTRIBUTIONS TO NASA EDUCATION PERFORMANCE MEASURES

- **Student data and Longitudinal Tracking:** Total awards = 100; Fellowship/Scholarship/Internships = 82; Higher Education/Research Infrastructure = 18; 33% of the total awards represent underrepresented minority funding and 40% of the total awards were to female students. Fifteen female students will be entering freshman year majoring in engineering in higher education. All other awardees are still enrolled in the STEM academic program as when funded.
- **Minority Serving Institutions:** VSGC partnered with several non-member institutions including two HBCU's, other Virginia institutions, and business/industry to provide programs and support to precollege and higher education students. VSGC partnered with Virginia State University (VSU) on two proposals and Norfolk State University (NSU) on one proposal for funding that are still pending. VSGC partnered with NSU to host a three-day summer academy for 70 high school seniors participating in a GEAR UP project, and VSGC contributed staff and materials support. VSGC presented scholarship/fellowship and research opportunities to faculty and students at Hampton University (HU) during visits to the campus. HU hosted a lunch and learn event for undergraduate and graduate students majoring in STEM to learn about scholarship/fellowship opportunities. VSGC was also presented at a Department Chair meeting in the School of Science at HU. VSGC served as a sponsor for an NSU faculty member to do research at NASA Langley; no funding was required.
- **Education Priorities Alignment:** VSGC scholarship/fellowship and higher education programs align with all of NASA's educational priorities including authentic, hands-on student experiences in science and engineering disciplines rooted in NASA-related issues, and the incorporation of real-life problem-solving and needs as context for activities. Several student research projects through the scholarship/fellowship program focused on NASA research priorities such as traditional aeronautics disciplines and climate change. Supported projects reflect diversity in institutions, faculty and student participants. Existing partnerships with community colleges are strengthened through projects such as the GAITE Saturdays and the outreach to community colleges through the ODU Small Satellite Technologies Laboratory project.
- In support of a NASA Space Grant area of emphasis, VSGC provided the New Investigator Program to strengthen Virginia's research infrastructure by providing startup funding to early career faculty from member institutions conducting research that is directly aligned with NASA's mission. VSGC's suite of precollege programs includes projects targeting both students and teachers and aligns with NASA's areas of emphasis. Several projects engage middle school students in hands-on activities and exposure to NASA scientific and technical expertise. Follow-up surveys were conducted of all participating teachers. One Space Grant-funded project provided Saturday programs for high school students on a college campus with the objective of increased enrollment in STEM disciplines and interest in STEM careers.

IMPROVEMENTS MADE IN THE PAST YEAR

- FY12 was an excellent year for VSGC externally-funded programs with eight proposals awarded out of 19 submitted with 10 proposals still pending and one proposal declined. Total amount awarded to VSGC was $1.8 million with $5.8 million pending in external funding (represents total amount awarded for several multi-year projects).
- VSGC continued to enhance state government engagement in Consortium programs and secured an additional $100,000 in matching state support for the VASTS program. In addition, VSGC was able to undertake very successful pilot programs with the additional $738,000 in matching support for this year through member institutions for three new STEM initiatives: Commonwealth Industry Internship Program; Virginia Space Coast Scholars; and Building Leaders for Advancing Science and Technology.
- Participation in VSGC programs by state legislators and members of the Governor's Cabinet continues to grow.
- VSGC is seen as a state leader for STEM educational programs by state educational agencies, the Governor's office, and the Virginia General Assembly.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

VSGC members and partners play active roles in project development and implementation. In some cases, VSGC provides funding directly to member institutions for projects and the member institution has the lead. In other projects, VSGC staff may take the lead for project coordination working closely with partners for project execution. For competitive opportunities, the VSGC uses a panel of member and sometimes external representatives to make selections of which students or faculty to fund.

VSGC Affiliate Members include: College of William and Mary (higher education), Hampton University (higher education), Old Dominion University (higher education), University of Virginia (higher education), Virginia Polytechnic Institute and State University (higher education), NASA Langley Research Center (NASA Center), NASA Goddard Space Flight Center's Wallops Flight Facility (NASA Facility), Science Museum of Virginia (informal education), State Council of High Education for Virginia (state agency for higher education), Virginia Community College System (higher education), Virginia Department of Education (state agency for precollege education), MathScience Innovation Center (informal education), Virginia Air and Space Center (informal education), and Virginia's Center for Innovative Technology (statewide nonprofit that creates technology-based economic development strategies to accelerate innovation and the next generation of technology and technology companies).

VSGC scholarships and fellowships are open only to students attending affiliate institutions, including all 23 community colleges. Internship support is available to students attending any Virginia higher education institution. VSGC partners not only with affiliates but with many other organizations and institutions including industry and NASA Centers on projects. NASA Langley and NASA Wallops were key partners in several VSGC projects.

The National Space Grant Office requires two annual reports, this Annual Performance Data Report (APD) and the Office of Education Performance Measurement System (OEPM) report. The former is primarily narrative and the latter data intensive. Because the reporting timeline cycles are different, data in the two reports may not necessarily agree at the time of report submission. OEPM data are used for official reporting.